



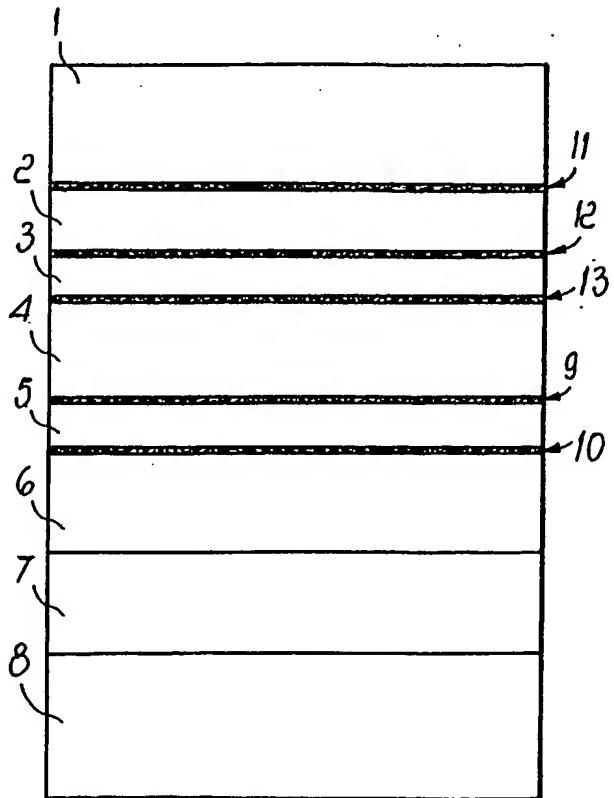
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> :  A61L 9/12		A1	(11) International Publication Number: <b>WO 98/23304</b>  (43) International Publication Date: 4 June 1998 (04.06.98)
(21) International Application Number: PCT/EP97/06477		(81) Designated States: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CU, CZ, EE, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 20 November 1997 (20.11.97)			
(30) Priority Data: PD96A000288 27 November 1996 (27.11.96) IT			
(71) Applicant (for all designated States except US): BURGOPACK STAMPA, TRASFORMAZIONE, IMBALLAGI S.P.A. [IT/IT]; Via Dalmastro, 2, I-36030 Lugo di Vicenza (IT).			
(72) Inventor; and		Published	
(75) Inventor/Applicant (for US only): VISONA', Sergio [IT/IT]; Via Matteotti, 52, I-36010 Vicenza (IT).		With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	
(74) Agent: MODIANO, Guido; Modiano & Associati, Via Meravigli, 16, I-20123 Milano (IT).			

## (54) Title: CONTAINER FOR EMANATING VOLATILE SUBSTANCES

## (57) Abstract

A container for volatile substances, which has at least one region closed by a multi-ply mated film in which a plurality of outer plies (1-5) can be identified which constitute an impermeable barrier for the volatile substance, and which is detachable from the permeable ply (6). In order to allow the separation of the barrier layer from the permeable ply (6) a coextruded element, which is substantially composed of three plies, is provided: respectively, an outer polyethylene (4), an intermediate EVOH ply (5), and an inner polyethylene ply (6), which acts as a permeable ply. In order to be sure that separation always occurs between the EVOH and the inner polyethylene layer, a bonding resin (9) is interposed between the outer polyethylene ply (4) and the EVOH ply (5), while a peelable resin (10) is extruded between the EVOH ply (5) and the inner polyethylene ply (6).



***FOR THE PURPOSES OF INFORMATION ONLY***

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		

## CONTAINER FOR EMANATING VOLATILE SUBSTANCES

Technical Field

The present invention relates to a container for emanating volatile substances.

Background Art

The container according to the present invention is of the kind that contains aromatic substances and is closed 5 with a multi-ply film in which two groups of detachable plies can be identified.

Multiple outer plies constitute a barrier for the aromatic substance, while a single inner ply, placed so as to close the containment compartment, is permeable to the 10 volatile substance.

In order to emanate the substance, the entire set of barrier plies is removed and only the permeable ply remains on the container.

Several problems arise in these containers.

15 On the one hand, when the container is in store (storage before use), the contained substance must not be able to escape in any way; on the other hand, separation of the barrier ply must occur without damaging the permeable ply.

20 Several kinds of container, manufactured in order to achieve these purposes, are known.

In a conventional solution, the permeable ply is constituted by paper, but this solution has the drawback that the substance permeates the paper and escapes through 25 the edges even while the barrier ply is still coupled (i.e., before use).

This entails the drawback that the containers empty

themselves even without being used.

Containers are also known wherein there is provided a film made of a foamed material opening along its thickness when the multi-ply layer that constitutes the barrier is 5 removed.

In this case, the foamed ply does not break uniformly and therefore the emanation of the contained product is unpredictable and therefore uncontrollable.

A solution is also known in which the plies that 10 separate are obtained by coextruding polyethylene (or other permeable resins) with polypropylene or polypropylene copolymers, or nylon and polyethylene.

This coextrusion operation, however, is very critical, since the strength of the connection between the two plies 15 that must subsequently separate is highly influenced by the extrusion temperature.

#### Disclosure of the Invention

The aim of the present invention is to overcome the problems found in conventional containers.

An important object is to provide a container which 20 before separating the barrier ply is impermeable to the volatile product, so that it can be stored even for very long periods.

Another important object is to achieve cohesion between the plies of the container in a manner which can be scarcely 25 affected by the process temperature.

Another object is to provide a container by using conventional components and conventional production methods.

This aim, these objects and others which will become apparent hereinafter are achieved by a container for

emanating volatile substances which is closed by a film formed by multiple outer plies, at least one of which constitutes a barrier for the volatile substance and at least one is a membrane which is permeable to the volatile 5 substance, said outermost plies (with respect to the container) being detachable from said permeable membrane, wherein said permeable membrane is made of polyethylene and is part of a coextruded element composed of at least three plies which are, sequentially, polyethylene-EVOH-10 polyethylene, with a peelable resin interposed between the EVOH ply and said permeable membrane.

EVOH is an ethylene-vinyl alcohol copolymer.

#### Brief Description of the Drawings

Further characteristics and advantages of the present invention will become apparent from the following detailed 15 description of an embodiment, which is given only by way of non-limitative example and is illustrated with the aid of the accompanying drawings, wherein:

figure 1 is a sectional view of a container according to the invention;

20 figure 2 is another sectional view, taken along the plane II-II of figure 1.

#### Ways of carrying out the Invention

With reference to the above figures, the container is composed of a lower body, designated by the reference letter A, which is closed at the top by a film, generally 25 designated by the reference letter B.

The lower body A forms a tray-like compartment C, in which the volatile product D is to be contained.

The film B is provided by means of a sequence of plies

which, starting from the outside, are:

- a paper ply 1;
- an aluminum ply 2;
- a polyester ply 3;
- 5 -- a polyethylene ply 4;
- an EVOH ply 5;
- a polyethylene ply 6.

The lower body A is obtained by means of a polyethylene  
ply 7 and a polyacrylonitrile ply 8.

10 The aluminum ply 2 is substantially the barrier  
element, while the polyethylene ply 6 is the permeable  
membrane.

15 In order to separate the group of plies 1, 2, 3, 4 and  
5 from the permeable ply 6, which during use is the element  
for closing the compartment C, the plies 4, 5 and 6 are  
first obtained by coextrusion.

20 More particularly, as shown in figure 2, coextrusion  
occurs by interposing a bonding resin 9 between the  
polyethylene ply 4 and the EVOH ply 5 and a peelable resin  
10 between the EVOH ply 5 and the polyethylene ply 6 that  
constitutes the permeable membrane.

25 In these conditions, coextrusion is not critical,  
particularly in terms of temperature, and the bond between  
the EVOH ply 5 and the polyethylene ply 6 is weaker than the  
bond between the polyethylene ply 4 and the EVOH ply 5.

The separation region is therefore always located at  
the peelable resin 10 and the polyethylene ply 6 is in any  
case not damaged by this operation.

30 As regards the connection among the other plies, it is  
convenient to interpose a layer of glue 11 between the paper

ply 1 and the aluminum ply 2, while an adhesive 12 is provided between the aluminum ply 2 and the polyethylene ply 3; likewise, a similar adhesive 13 is interposed between the polyester ply 3 and the polyethylene ply 4.

5 The advantages of a film of this kind are linked to the easy manufacture of the coextruded element, in which it is possible to perfectly control the resistance to ply separation between the EVOH and the polyethylene.

10 The aluminum barrier, which is known to be much weaker than polyethylene and polyester, is arranged so that it is not affected by mechanical stresses.

15 From the above description and from the illustrations it is evident that the intended aim and objects have been achieved by adopting a new combination of plies which ensures separation as well as perfect tightness and impermeability to volatile substances when the container is intact.

20 In order to facilitate separation, a small already-separated region 14 is provided which allows easy grip and guides separation of the plies in the chosen point.

CLAIMS

1        1. A container for emanating volatile substances,  
2 closed by a film formed by multiple plies, at least one of  
3 the outer said plies constituting a barrier for the volatile  
4 substance and at least one being a membrane which is  
5 permeable to the volatile substance, said outermost plies  
6 being detachable from said permeable membrane, characterized  
7 in that said permeable membrane is made of polyethylene and  
8 is part of a coextruded element composed of at least three  
9 plies which are, sequentially, polyethylene-EVOH-  
10 polyethylene, with a peelable resin interposed between the  
11 EVOH ply and said permeable membrane.

1        2. A container according to claim 1, characterized in  
2 that said coextruded element is composed of a polyethylene  
3 ply which is firmly coupled, also with the aid of a bonding  
4 resin, to the EVOH ply, which is more weakly coupled, also  
5 by means of the interposition of a peelable resin, to the  
6 polyethylene ply which acts as permeable membrane.

1        3. A container according to claim 1, characterized in  
2 that said coextruded element is firmly coupled, on the  
3 opposite side with respect to said peelable membrane, to an  
4 additional triple ply which has a barrier function.

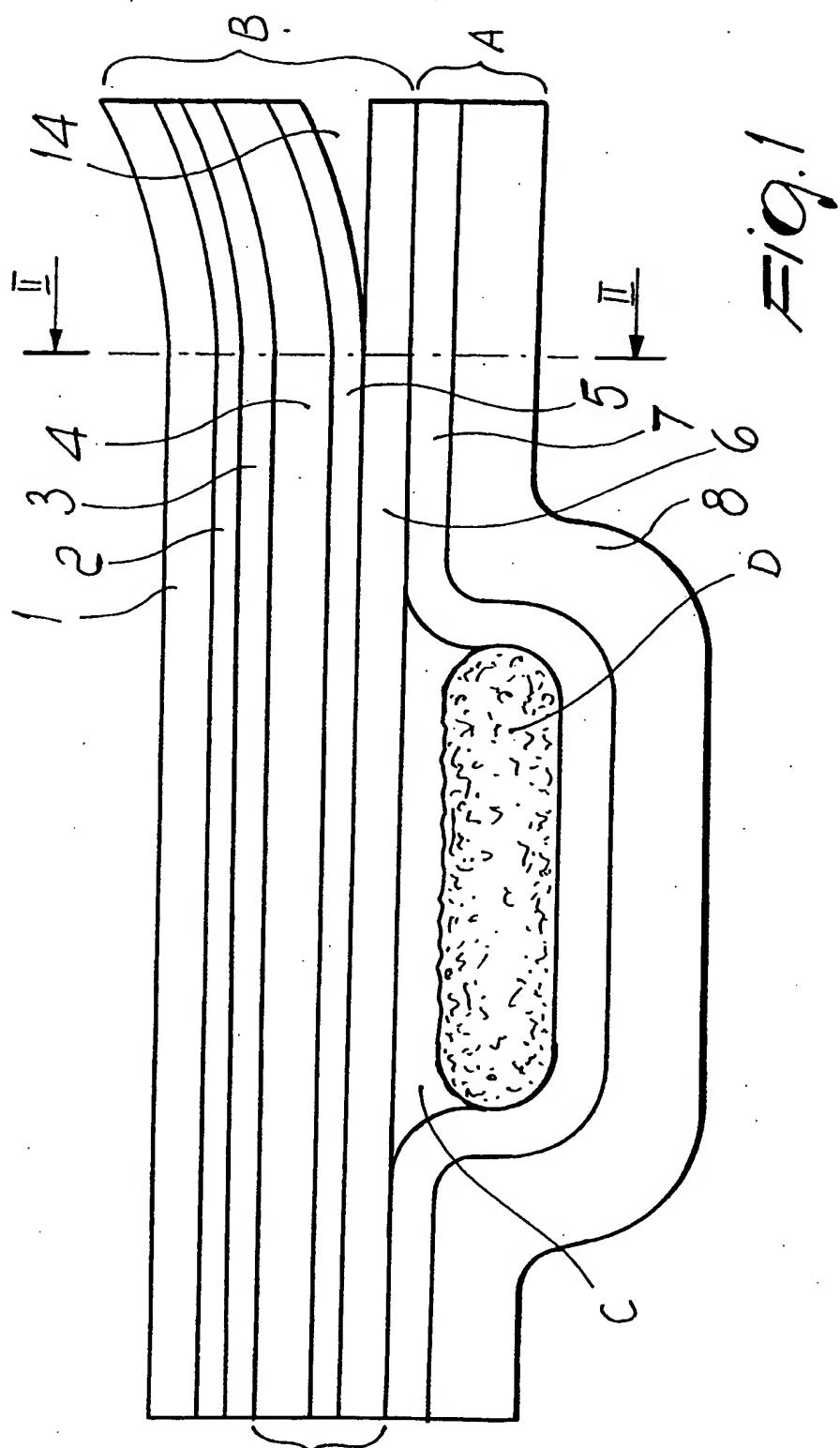
1        4. A container according to claim 3, characterized in  
2 that said triple ply is composed externally of a paper ply  
3 which is coupled to an aluminum sheet which is in turn  
4 coupled to a polyester ply.

1        5. A container according to claim 1, characterized in  
2 that the weakest coupling among the various plies is between  
3 the EVOH ply of the coextruded element and the polyethylene

4      ply that constitutes the permeable membrane.

1            6. A container according to claim 5, characterized in  
2      that the closure of the various plies is hermetic along the  
3      edges and constitutes a barrier to the volatile substance.

1            7. A container according to claim 1, characterized in  
2      that it has a small separated region between the EVOH and  
3      the permeable membrane which constitutes a grip tab for  
4      separating the two parts of the film at this coupling.



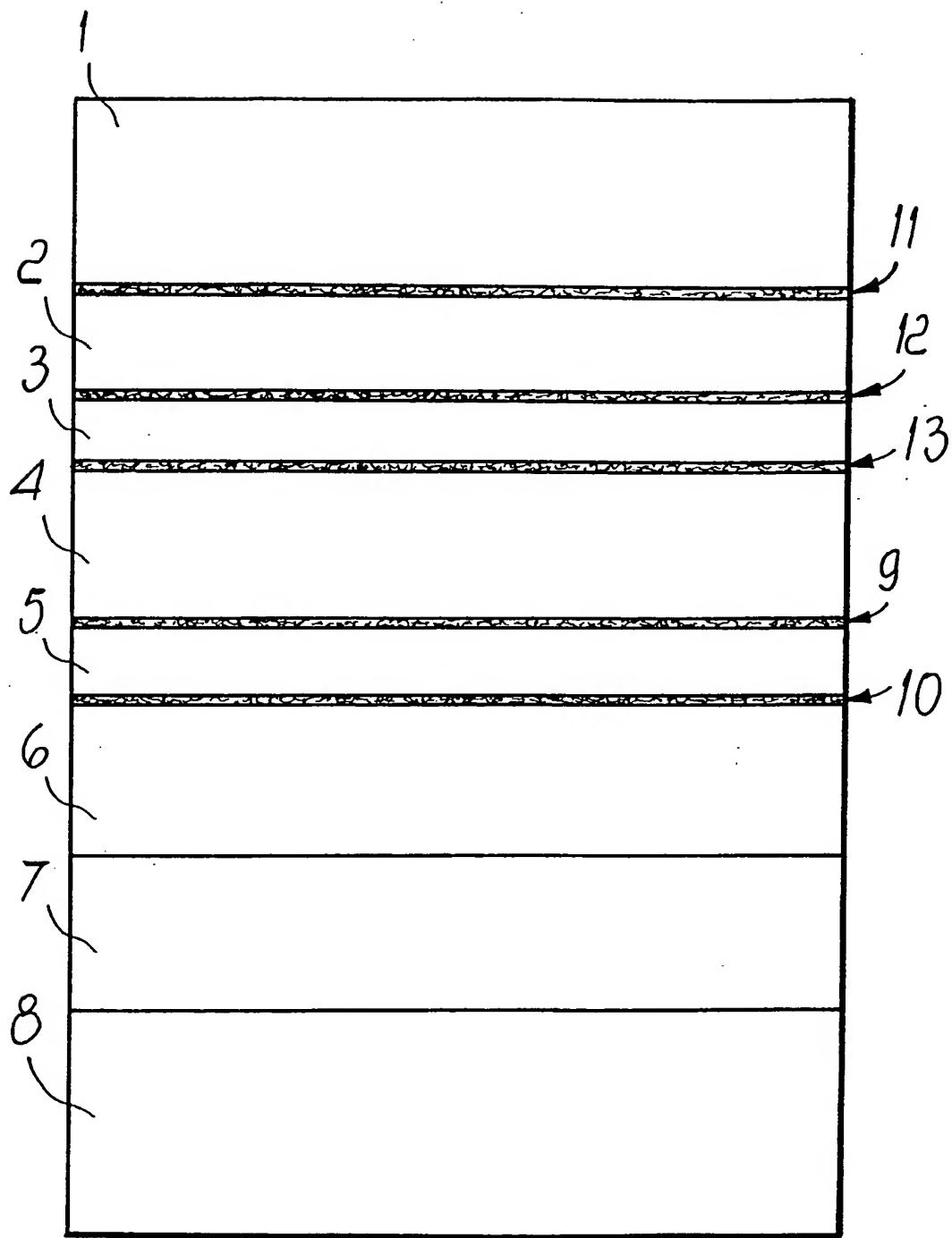


Fig. 2

# INTERNATIONAL SEARCH REPORT

Int'l. application No

PCT/EP 97/06477

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 A61L9/12

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 518 790 A (HUBER HANS-PETER ET AL) 21 May 1996 see column 3, line 47-50 see column 5, line 15-27 see column 5, line 63-66 see column 6, line 12-15 see column 6, line 39-41 see column 6, line 49-63 ---	1-7
A	GB 1 572 603 A (MARDON FLEXIBLE PACKAGING LTD) 30 July 1980 see claims 6-9 ---	1-7
A	WO 84 02654 A (FIRMENICH & CIE) 19 July 1984 see claims ---	4
A	US 4 161 283 A (HYMAN SY) 17 July 1979 ---	-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

1

Date of the actual completion of the international search	Date of mailing of the international search report
8 April 1998	17/04/1998
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl Fax: (+31-70) 340-3016	Authorized officer  Dalkafouki, A

**INTERNATIONAL SEARCH REPORT**International Application No  
PCT/EP 97/06477**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 145 001 A (WEYENBERG ROBERT J ET AL) 20 March 1979 -----	
A	EP 0 300 286 A (FIRMENICH & CIE) 25 January 1989 -----	

## INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte Jonat Application No

PCT/EP 97/06477

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5518790 A	21-05-96	DE 4236886 A		05-05-94
		AT 160752 T		15-12-97
		AU 663229 B		28-09-95
		AU 4873493 A		12-05-94
		BR 9304275 A		03-05-94
		CA 2105955 A		01-05-94
		CN 1086488 A		11-05-94
		DE 9219105 U		05-03-98
		DE 59307780 D		15-01-98
		EP 0596212 A		11-05-94
		JP 2598605 B		09-04-97
		JP 6219479 A		09-08-94
		MX 9306092 A		30-06-94
GB 1572603 A	30-07-80	NONE		
WO 8402654 A	19-07-84	CH 662736 A		30-10-87
		AU 566182 B		08-10-87
		AU 2349084 A		02-08-84
		BE 898675 A		13-07-84
		BR 8404703 A		26-12-84
		CA 1230048 A		08-12-87
		DE 3490012 C		14-01-93
		DE 3490012 T		24-01-85
		FR 2539492 A		20-07-84
		GB 2149664 A,B		19-06-85
		JP 4025022 B		28-04-92
		JP 60500321 T		14-03-85
		NL 189110 B		17-08-92
		NL 8420001 T		03-12-84
		US 4634614 A		06-01-87
US 4161283 A	17-07-79	US 4285468 A		25-08-81
US 4145001 A	20-03-79	BR 7806029 A		02-05-79
EP 0300286 A	25-01-89	AU 608340 B		28-03-91
		AU 1926888 A		27-01-89
		CA 1306175 A		11-08-92
		JP 1049628 A		27-02-89

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

In't Jonat Application No  
PCT/EP 97/06477

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0300286 A		US 4990381 A	05-02-91